CASE REPORT

Laparoscopic Common Bile Duct Exploration in Pregnancy With Acute Gallstone Pancreatitis

Young W. Kim, MD, Stanley M. Zagorski, MD, Mathew H. Chung, MD

ABSTRACT

Background: We present a case in which a laparoscopic common bile duct exploration was performed safely in a pregnant patient with acute gallstone pancreatitis.

Case Report: A 25-year-old female, gravida 4 para 3, at 14-weeks gestation presented to her obstetrician with complaints of epigastric pain radiating to the back. She was otherwise healthy with no past medical or surgical history. A physical examination revealed a healthy young female with no evidence of jaundice and in no acute distress. An abdominal examination was remarkable for a gravid abdomen with mild tenderness to palpation in her epigastrium and negative Murphy's sign. The patient safely underwent a laparoscopic common bile duct exploration after a laparoscopic cholecystectomy was performed.

Conclusion: This case illustrates the role of laparoscopic common bile duct exploration in the diagnosis and treatment of possible choledocholithiasis in a pregnant patient.

Key Words: Pregnancy, Laparoscopic common bile duct exploration, Gallstone pancreatitis, Choledocholithiasis.

INTRODUCTION

The incidence of acute pancreatitis during pregnancy is relatively rare with a recent reported rate of 1 in 3333 pregnancies to 5 to 10 gravid in 10 000 deliveries. Most cases of pancreatitis in pregnancy are associated with gallstone disease. Although postoperative use of endoscopic retrograde cholangiopancreatography (ERCP) remains an essential part in managing retained common bile duct (CBD) stones, routine use of preoperative ERCP in patients suspected of having CBD stones has declined as a result of low yield, increasing availability of laparoscopic bile duct exploration, and the risk of complications. However, indications for laparoscopic common bile duct exploration in pregnant patients, following an episode of gallstone pancreatitis, are yet to be clearly defined. In this article, we describe a pregnant patient at 14 weeks who was found to have acute gallstone pancreatitis and was subsequently treated with laparoscopic cholecystectomy and laparoscopic transcystic common bile duct exploration. The patient's pregnancy course remained uncomplicated, a healthy baby being delivered at 41 weeks and 1 day via spontaneous vaginal delivery. We conclude that laparoscopic common bile duct exploration is a feasible and safe option in pregnant patients suffering from an acute case of gallstone pancreatitis.

METHODS

Initial laboratory tests revealed amylase >1300 U/L; lipase >3000 U/L; alanine aminotransferase = 837 U/L; aspartate aminotransferase = 843 U/L; alkaline phosphatase = 125 U/L; total bilirubin = 0.8 mg/dL; white blood count = $9.7x10^9$/L. Right upper quadrant ultrasound showed no intrahepatic ductal dilation, a common bile duct measuring 4.2 mm in diameter, and several gallstones present with the largest being mobile and measuring 1.6 cm. No evidence of pericholecystic fluid was present. The gallbladder wall measured 2.3 mm in thickness. No sonographic Murphy's sign was evident. Once the diagnosis of acute pancreatitis was made, the patient was admitted and improved rapidly on supportive care. The patient was taken to the operating room once the pancreatitis resolved. After general endotracheal anesthesia was administered, the OB-GYN service performed a fetal ultrasound,

Department of Surgery, Tripler Army Medical Center, Honolulu, Hawaii, USA (all authors).

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Address reprint requests to: Stanley Zagorski, MD, FACS, Department of Surgery: MCHK-DSG, 1 Jarrett White Rd, Tripler Army Medical Center, Honolulu, HI 96859-5000, USA. Telephone: 808 433 3435, Fax: 808 433 6539, E-mail: Stanley.Zagorski@amedd.army.mil

which confirmed an intrauterine pregnancy with positive heart tones. A roll was placed behind the right back to minimize compression of her inferior vena cava and compression stockings were placed. A standard Hasson technique was used to gain entrance into the peritoneal cavity at the umbilicus. After insufflation was administered to a pressure of 10 mm Hg, three 5-mm ports were placed in the right upper quadrant and subxiphoid area under direct visualization. Calot's triangle was then exposed and dissected to perform an intraoperative cholangiogram. A lead shield was placed over the fetus in sterile fashion. A cholangiogram subsequently revealed significantly delayed flow into the duodenum and a possible filling defect in the distal common bile duct. The patient was subsequently given 1 mg of Glucagon intravenously and a second cholangiogram was performed showing the persistent filling defect. The decision was made to perform a laparoscopic transcystic common bile duct exploration through a separate percutaneous sheath in the right upper quadrant, utilizing the Cook catheter system. A 7-French flexible choledochoscope was then placed into the common bile duct via the catheter and exploration performed. No evidence was found of common bile duct stones or obstruction. The choledochoscope was advanced into the duodenum. We found the procedure to be no more difficult than our typical laparoscopic common bile duct exploration. A laparoscopic cholecystectomy was then performed in the standard fashion. The patient tolerated the procedure well with no complications.

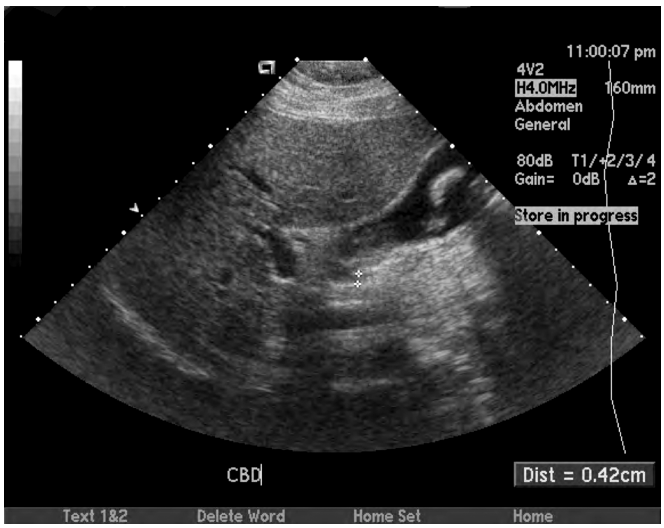

Figure 1. Right Upper Quadrant Ultrasound—Common Bile Duct. Ultrasonographic images at the time of presentation revealed a mildly dilated common bile duct measuring 4.2 mm in diameter.

Figure 2. Right Upper Quadrant Ultrasound—Gallbladder. Ultrasonographic images of the gallbladder at the time of presentation revealed several gallstones, the largest of which was 1.6 cm and mobile. No evidence is present of pericholecystic fluid. Gallbladder wall was normal measuring 2.3 mm.

RESULTS

The postoperative course was uneventful, fetal heart tones were normal, and the patient was discharged on postoperative day 2. The pregnancy progressed to term, and the patient delivered via spontaneous vaginal delivery at 41 weeks and 1 day a healthy 3727-g female with Apgar scores of 8 and 9 at 1 and 5 minutes, respectively. Both mother and daughter were well 1 year postpartum.

DISCUSSION

Biliary tract disease is reported to represent the second most nonobstetric surgical emergency during pregnancy.[1] It has been postulated that pregnancy is associated with an increased percentage of cholic acid, increased cholesterol secretion, increased bile acid pool size, decreased enterohepatic circulation, decreased percentage of chenodeoxycholic acid, and increased bile stasis.[2] When gallstone pancreatitis occurs in pregnancy, it can present a challenge to the general surgeon and be a potential source of significant morbidity and even mortality. Earlier reports have described a maternal mortality rate ranging from 15%[3] to 37%[4] for an episode of acute pancreatitis during pregnancy, although in a more recent series, no maternal mortality was reported.[5]

For nonpregnant patients, a general approach to the man-

Table 1.
Laparoscopy Cholecystectomy During Pregnancy

Study	N	Trimester			Spontaneous Abortion	Preterm	Followed to Delivery
		I	II	III			
Lanzafame[10]	5	0	3	2	0	0	5
O'Connor et al[11]	9	1	8	0	0	0	9
Steinbrook et al[12]	10	3	6	1	0	0	7*

*Three patients not followed to delivery.

agement of biliary pancreatitis is initial supportive care.[6] Most patients will then undergo a cholecystectomy after the resolution of their pancreatitis. For those patients with a high probability of common bile duct stones, a preoperative ERCP is generally advocated. However, other patients with a low probability of choledocholithiasis will undergo laparoscopic cholecystectomy and intraoperative cholangiography once the pancreatitis has resolved. If evidence of stones is present following intraoperative cholangiography, then a laparoscopic transcystic common duct exploration, laparoscopic choledochotomy, open common duct exploration, close observation, or postoperative ERCP may be performed based on the operator's expertise and the clinical scenario. In general, laparoscopic clearance of duct calculi by means of the cystic duct approach is achieved in approximately 80% to 90% of attempts,[7] appearing to be a viable alternative to postoperative ERCP. This approach seems valuable when one considers the potential teratogenic effects of radiation exposure when ERCP is performed in the first trimester and the inability to appropriately shield the fetus from radiation during the third trimester.[8] However, such recommendations for laparoscopic management of biliopancreatic disease to include laparoscopic common bile duct exploration in pregnancy are yet to be precisely defined. In our patient, the significant delay of flow of contrast into the duodenum with a possible filling defect in the distal common bile duct prompted a laparoscopic common bile duct exploration. We did not want to expose the patient to another procedure with its attendant comorbidity. The procedure did not reveal any stones or obstructions. To have had the procedure halted or postponed for a postoperative ERCP would have required additional time and effort as well as being logistically difficult.

Although pregnancy remained as one of the contraindications to laparoscopy during the early 1990s,[9] advances in laparoscopic surgery have led to a number of reports documenting the feasibility of performing laparoscopic cholecystectomy during pregnancy, suggesting that the procedure may be performed safely without maternal morbidity or fetal loss when accepted management guidelines are followed **(Table 1)**.[10–12] The timing of surgery is considered to be safest during the second trimester of pregnancy as organogenesis is complete by the first trimester, and the uterine size is not large enough to interfere in the field of surgery. Additionally, the risk of inducing preterm labor and spontaneous abortion is the lowest during the second trimester. Patients are usually placed in the reverse Trendelenburg position with caution being taken to minimize compression of the vena cava by the gravid uterus as was performed in our case. Left lateral rotation is also recommended to displace the uterus from the vena cava.[13] Initial trocar placement is made under direct vision (Hasson technique), either from below the umbilicus if the uterus is not very big or via the right upper quadrant lateral to the midclavicular line in later stages of pregnancy. The remaining ports are placed under direct visualization. A lead shield should be placed over the lower abdomen to minimize radiation exposure to the fetus during cholangiography. Conversion to open cholecystectomy should be performed if intraoperative conditions make continued laparoscopic surgery unsafe.[10]

Table 2.
Clearance Rates: Laparoscopic Common Bile Duct Exploration Versus Endoscopic Management

Study	N	LCBDE*	EM*
Hawasli et al[14]	89	49/51 (96%)	31/38 (82%)
Rhodes et al[15]	80	30/40 (75%)	30/40 (75%)
Suc et al[16]	202	105/105 (100%)	92/97 (95%)

*LCBDE = Laparoscopic common bile duct exploration; EM = endoscopic management.

Laparoscopic common bile duct exploration (LCBDE) is also advocated by a number of authors citing similar

Table 3.
Laparoscopic Common Bile Duct Exploration in Pregnancy

Study	N	Trimester			Spontaneous Abortion	Preterm	Followed to Delivery
		I	II	III			
Liberman et al[19]	2	1	1	0	0	0	2
Tuech et al[20]	1	0	1	0	0	0	1*

*Choledochotomy performed after failure of laparoscopic common bile duct exploration.

clearance rates compared with those for endoscopic treatment **(Table 2)**.[14–16] The location of the bile duct stones, size, number, as well as the anatomy are considered when choosing between a transcystic approach and choledochotomy. Guidelines for a laparoscopic transcystic approach[17] include the presence of a small (<0.8 cm) stone in the CBD; the presence of a limited number of CBD stones (no more than 5), the absence of stones in the common hepatic duct, and the cyst duct joining the CBD on its lateral or posterior (not the medial) aspect. Choledochotomy is indicated when the transcystic approach fails or is contraindicated, when biliary lithotripsy is needed, or when the CBD is dilated more than 7 mm.[18] The number of case reports describing LCBDE in pregnant women is limited, but they appear to advocate this procedure as a safe alternative to ERCP. Liberman describes[19] LCBDE performed in 2 pregnant patients with choledocholithiasis without any complications. In Tuech's[20] report, a laparoscopic CBD stone removal was attempted in a pregnant patient that was later converted to choledochotomy after the initial procedure had failed. All patients were followed to delivery without any complications **(Table 3)**. To our knowledge, our report is the first to describe the laparoscopic common bile duct exploration approach in a pregnant patient suffering from gallstone pancreatitis.

CONCLUSION

In summary, we report about a patient who presented with an acute case of gallstone pancreatitis at a relatively early stage in her pregnancy (14 weeks) and who successfully underwent laparoscopic cholecystectomy and transcystic common bile duct exploration. This procedure potentially avoided an open common duct exploration as well as additional postoperative invasive procedures that would not have been beneficial for either mother or fetus. As such, laparoscopic common bile duct exploration in the pregnant patient appears to be a technically feasible procedure and a viable alternative for treatment in the pregnant patient with acute gallstone pancreatitis.

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